investigate whether aliskiren regulates renal aquaporin expression and prevents lithium-induced nephrogenic diabetes insipidus. Mice injected with aliskiren developed decreased urine output and increased urine osmolality when compared with controls. Aliskiren significantly increased AQP2 protein abundance in the kidney inner medulla. Immunohistochemistry and immunofluoresence showed increased apical and intracellular labeling of AQP2 in collecting duct principal cells of kidneys in mice treated with aliskiren. In lithium-treated mice, aliskiren prevented urinary concentrating defect and improved the downregulation of AQP2 protein abundance in inner medulla of the kidney. In primary cultured rat inner medullary collecting duct cells, aliskiren dramatically increased AQP2 protein abundance which was significantly inhibited either by PKA inhibitor H89 or by adenylyl cyclase inhibitor MDL12330, indicating an involvement of the cAMP signalling pathway in mediating aliskiren-induced increased AQP2 expression. In conclusion, the direct renin inhibitor aliskiren upregulates AQP2 protein expression in inner medullary collecting duct principal cells and prevents lithium-induced nephrogenic diabetes insipidus likely via PKA-cAMP pathways.

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0317
Whole Genome Sequencing Identifying Causative Gene in a Familial Focal and Segmental Glomerulosclerosis

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Objective: Whole genome sequencing was preceded in a familial focal and segmental glomerulosclerosis (FSGS), then multi-step screening was made for the data from sequencing to choose the candidate genes, provide the theoretical basis for early diagnosis and accurate treatment of FSGS.
Methods: We chose 2 patients who had been identified as FSGS and their mother from a family. The peripheral blood was obtained to extract DNA from the three using the QIAquick Gel Extraction kit and then whole genome sequencing using the Illumina HiSeq X Ten. The result were filtered against the human databases of HAPMAP, dbSNP138 and 1000 Genome Project, and common variations which had been reported were wiped out, then non-synonymous variants in exonic and splicing regions were retained. Using SIFT and Polyphen-2 software to predict the influence in protein function of the variations and candidate genes was selected initially. And then query OMIM, GO, KEGG pathway databases to analyze its biological characteristics and the potential mechanism.
Results: By sequencing, we got four types of variant. The numbers of SNVs were 3038061, 3132594 and 3037609 SNVs, the numbers of InDels were 401259, 432406 and 398040, the numbers of SVs were 2917, 2211 and 3088, and the numbers of CNVs were 135, 211 and 91. After multi-step screening, with 54 SNVs and 455 InDels are shared by the two patients. Combining the non-synonymous variation from the three that patients with homozygous or compound heterozygous variation and their mother with heterozygous variation, 19 genes (KDM4A, TCF7L1, ADRA2B, KIF1A, TOP2B, GPR115, AK9, KCNT1, WDR96, ZNF384, KRT3, DDX55, ADCK1, TIPIN, JMJD8, STUB1, FAM83G, SLC5A10, SH3BGR) were screened out.
Conclusion: Through whole genome sequencing on an autosomal recessive pedigree of FSGS, we got 19 genes, which are different from the previous reports. It suggests that novel causative genes exist in this pedigree and more investigation is necessary.

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0319
Clinical and Pathological Features of Idiopathic Membranous Nephropathy in Young Adults and Analysis of Outcomes

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Objective: Idiopathic membranous nephropathy (IMN) is common in elderly patients. However, the prevalence in young adults is rising, and it is necessary to study their clinical and pathological features.
Methods: We retrospectively analyzed 77 young adult patients ($\leq$ 35 years old) and 160 elderly patients ($\geq$ 60 years old) hospitalized in our department between 2009 and 2014 with biopsy-proven IMN.
Results: The young adult IMN patients had a higher ratio of microscopic hematuria ($P < 0.01$) but lower ratio of kidney function deficiency ($P < 0.01$), hypertension ($P < 0.01$) and diabetes ($P = 0.021$) compared to elderly patients. Meanwhile, the renal pathological changes in young adult IMN patients are milder, as the incidence of interstitial fibrosis, infiltration of inflammatory cells and arterioles lesions are lower than in elderly patients ($P < 0.01$). The mean follow-up time was 27.3 months. Young adult group had a higher complete remission rate (48.1% vs. 36.3%, $P = 0.083$), although the total (complete and partial) remission rate was similar (75.3% vs. 71.3%, $P = 0.510$).
Conclusion: The young adult IMN patients have better renal function and milder renal pathological lesions compared to elderly patients. All of them have a rather good outcome but young adult group has higher complete remission rate.

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0322
Inhibition of Mitochondrial Complex-1 Prevents Downregulation of NKCC2 and ENaCα in Obstructive Nephropathy

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Objective: Ureteral obstruction with subsequent hydronephrosis is a common clinical complication. Downregulation of renal sodium transporters in obstructed kidneys could contribute to impaired urinary concentrating capability and salt waste following the release of a ureteral obstruction. This study investigated the role of mitochondrial complex-1 inhibition in modulating sodium transporters in obstructive nephropathy.
Methods: Sodium transporters were determined by qRT-PCR, Western blotting, and immunohistochemistry. Mitochondrial DNA copy number (mtDNA), mitochondrial transcription factor (mTFAM), and mitochondria-encoded NADH dehydrogenase 1 (mtNd1) were identified. A number of known sodium modulators, including PGE2, ET1, Ang II, natriuretic peptides (ANP, BNP, and CNP), and nitric oxide synthases (iNOS, nNOS, and eNOS) were also examined.
Results: Following unilateral ureteral obstruction (UUO) for 7 days, sodium transporters including NHE3, α-Na-K-ATPase, NCC, NKCC2, p-NKCC2, ENaCα, and ENaCγ were remarkably reduced by 60—90% contrasting to unaltered expression of ENaCβ, as determined by qRT-PCR, Western blotting, and immunohistochemistry. This global down regulation of sodium transporters was accompanied by striking reduction of mitochondrial DNA copy number (mtDNA), mitochondrial transcription factor (mTFAM), and mitochondria-encoded NADH dehydrogenase 1 (mtNd1) indicating a mitochondrial abnormality. Strikingly, specific inhibition of mitochondrial complex-1 by rotenone (500 ppm in diet) completely abolished the downregulation of NKCC2, p-NKCC2, and ENaCα without affecting other sodium transporters. A number of known sodium modulators, including PGE2, ET1, Ang II, natriuretic peptides (ANP, BNP, and CNP), and nitric oxide synthases (iNOS, nNOS, and eNOS) were strikingly elevated by 3 to 80 folds except for nNOSin obstructed kidneys. After rotenone administration, only BNP (+80 folds)and iNOS (+4 folds) but not others were significantly reduced by 62% and 96%, respectively.
Conclusion: Taken together, these findings showed a substantial role of mitochondrial dysfunction in mediating the down regulation of NKCC2 and ENaCα in obstructive nephropathy, possibly via iNOS-derived nitric oxide and BNP.

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0323
1α,25-dihydroxyvitamin D3 Influences Expression of Ki67 and mTOR in Thy-1 Nephritis Rat

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Objective: The aim of this research was to study the expression of Ki67 and mTOR in Thy-1 nephritis rat which used 1α,25-dihydroxyvitamin D3 (1,25(OH) 2D3), and its mechanism.